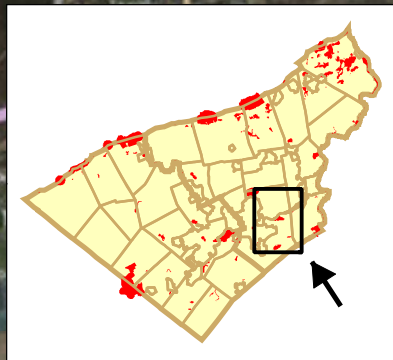
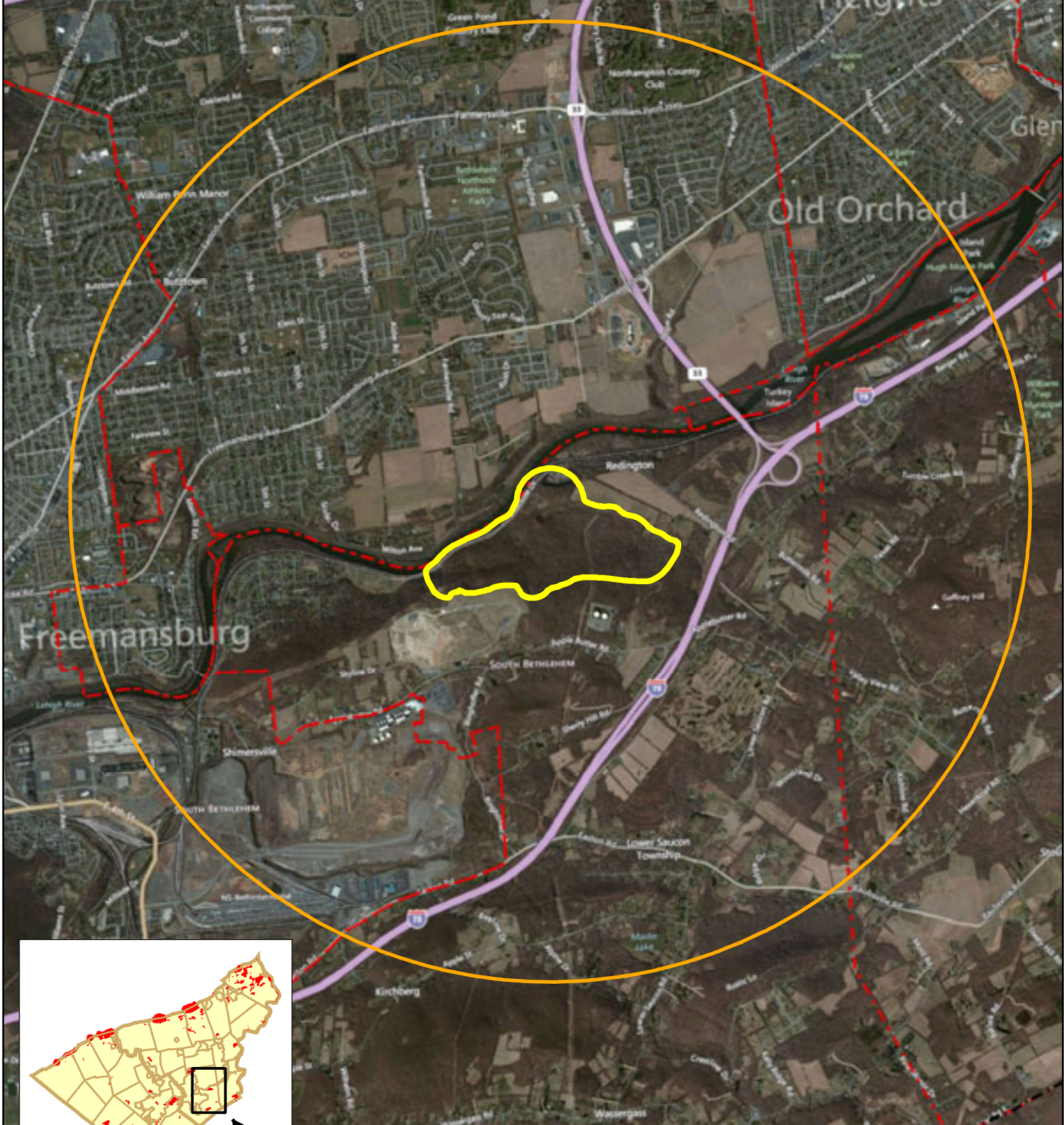


# Bull Run NHA

Natural Heritage Inventory of Lehigh and Northampton Counties,  
Pennsylvania – Update 2013




### Legend

- Core Habitat (focus NHAs)
- Supporting Landscape
- Municipal Boundary
- County Boundary

## Bull Run NHA – State Significance

Species or natural communities of concern that can be found in this NHA include the following:

Species or Natural Community Name:	Taxa	PNHP Rank <sup>1</sup>		PA Legal Status <sup>1</sup> (Proposed)	Last Seen	Quality <sup>2</sup>
		Global	State			
Skunk cabbage - golden saxifrage forest seep	<b>C</b>	GNR	S4S5	N	2011	AB
Sensitive Species of Concern A <sup>3</sup>	<b>S</b>	--	--	--	2011	AB
Sensitive Species of Concern B <sup>3</sup>	<b>S</b>	--	--	--	1998	D
Ellisia ( <i>Ellisia nyctelea</i> )		G5	S2	PT (PT)	2000	C



(Element type: Communities, Sensitive Species, Mammals, Birds, Fish, Amphibians, Mussels, Odonates, Lepidopterans, Plants)

<sup>1</sup>See the PNHP website (<http://www.naturalheritage.state.pa.us/RankStatusDef.aspx>) for an explanation of PNHP ranks and legal status. A legal status in parentheses is a status change recommended by the Pennsylvania Biological Survey.

<sup>2</sup>See NatureServe website (<http://www.natureserve.org/explorer/eorankguide.htm>) for an explanation of quality ranks.

<sup>3</sup>This species is not named by request of the jurisdictional agency responsible for its protection.

**Location:** This Natural Heritage Area occurs along the south bank of the Lehigh River. It is roughly bounded by the Lehigh River on the north, Redington Road on the east, Apple Butter Road on the south and the Bethlehem landfill on the west.

o Municipalities:

o Northampton County: Lower Saucon Township

o USGS Quadrangles: Nazareth

o Watersheds (HUC 12): Lehigh River

o 1999 Lehigh & Northampton Natural Areas Inventory reference: Includes all or portions of “Redington Cave”, “Steel City Slopes”

o 2005 Lehigh & Northampton Natural Areas Inventory Update reference: Includes all or portions of “Bull Run”, “Redington Cave”, “Steel City Slopes”

**Description:** This gently sloping forested hillside contains several seeps which contribute to Bull Run at the base of the slope that then meets the Lehigh River. The forested hillside includes a relatively diverse and richly forested habitat, caves and the shoreline of the river. The dominant tree species include sugar maple (*Acer saccharum*), red oak (*Quercus rubra*) and tulip tree (*Liriodendron tulipifera*). Many of the canopy trees are quite impressive in girth and suggest a habitat that has had only limited recent disturbance. The forested area includes nearly 200 acres of interior forest, which is considered forest at least 100 meters in from the edge of any opening such as a field, road, railroad or utility rights-of-way. The area between the forest edge and 100 meters into the forest is considered highly influenced by edge effects, such as increased levels of light, noise,



Rocky Gleason, (PNHP)

Parts of the forest of Bull Run have good structural and species diversity. Trees of all age classes and a diverse native shrub and herbaceous layer reflect a lack of recent disturbance to this part of the forest.

temperature, wind and dryness which create much different habitat conditions than those found in interior forest conditions. Interior forest conditions are essential habitat for interior forest dwelling birds such as Scarlet Tanagers, Worm-eating Warblers, and Ovenbirds.

#### Element of Concern Considerations:

- Skunk cabbage - golden saxifrage forest seeps are where groundwater meets the surface and diffuses through the soil to form a wide, shallow area of muck soil, often dominated by skunk cabbage. Typically the community is over-topped by trees and shrubs from the surrounding forest, although large examples will be open. Herbaceous species are strongly dominant and tend to be relatively diverse, especially where there is greater mineral enrichment. Bedrock disruptions such as drilling or mining in nearby areas can contaminate or alter the flow patterns of the groundwater that feeds the seepage (McPherson, 2011).
- The “sensitive species of concern A”, which is not named at the request of the jurisdictional agency overseeing its protection, uses the forested areas as its primary habitat. Fragmentation of the forest canopy could decrease the suitable habitat available to this species at this location. These woodlands may be detrimentally altered by encroachment of invasive species, over-browsing by deer, and fragmentation. Fragmentation can have a drying effect on the habitat and promote invasive species growth.
- The “sensitive species of concern B”, which is not named at the request of the jurisdictional agency overseeing its protection, uses caves and mine openings during part of its lifecycle. Species that inhabit the cave system are sensitive to even minor disturbance to the water quality and cave environment. Streams and surface runoff enter sinkholes and caves, bypassing natural filtration through soil and sediment. In addition, the porous carbonate bedrock typical of karst topography allows solid and liquid wastes to seep into caves and groundwater. Blasting or other activities that disrupt bedrock within the core areas may damage the structure of the cave, potentially making it unusable by the species of concern. Deforestation on the surface causes changes in hydrology and increased sedimentation in caves. Alteration of cave entranceways such as vegetation removal and structural changes, such as closure, can affect climatic conditions in the cave, including airflow, temperature, and humidity. Cave entrances should be buffered from disturbance by at least 160 meters (525 feet).
- *Ellisia* is a small spring annual herb that grows on damp, shady stream banks with rich alluvial soils and sometimes in disturbed ground. The habitats that *ellisia* depends on are highly influenced by flooding events. Alteration of the natural flood cycle, dam building, increased erosion, and clearing of floodplain forests all affect the quality of suitable habitat. Populations are also threatened by loss of habitat from development and displacement by invasive plants. Protection of *ellisia* will require maintenance of known populations and preservation of rich, shaded stream bank communities. This may include sustaining appropriate hydrology, removal of invasive plants, and establishment of buffers that can moderate the effects of scouring events and run-off.

#### Habitat Disturbances:

- Historic –
  - Aerial photos taken of the area in 1939 (<http://www.pennpilot.psu.edu/>) show that much of what is forested now was forested then. Though the forest was likely cut for lumber and fuel several times since colonial days, much of the forest has been standing for over 100 years. The forest likely contains individual trees that are much older.
  - Parts of what is forest now was at that time cleared and modified, perhaps partly for agriculture, but also for a quarry operation adjacent to the Lehigh River.
  - The landscape surrounding the forested hillside was dominated by active agriculture.
  - A road and railroad were constructed along the Lehigh River prior to 1939.
- Current –
  - The construction of Interstate 78 fragmented the eastern portion of the forested hill.
  - A utility ROW divided the contiguous forested habitat into two smaller pieces of interior forest.
  - The integrity of the cave habitat can be threatened by disturbance during the months of November through April. The most common form of disturbance is human traffic. Blasting or other activities that disrupt bedrock within the core areas may damage the structure of the cave, potentially making it unusable by the species of concern.
  - Some of the formerly cleared and modified lands have since reverted to early successional forest. Unfortunately, conversion of agricultural fields to forest often results in a woodlot that is choked

- with invasive species of plants that can rapidly populate a disturbed habitat. Edge habitats associated with roads, utility corridors, agricultural fields and residential neighborhoods are particularly susceptible to weedy plant invasion and will require a sustained and targeted approach to invasive plant management.
- Over browsing by white-tailed deer is a serious threat to the overall understory plant diversity. An overabundance of deer can create the effect of park-like forests in which the understory and vertical stratification is greatly reduced. Removal of understory species eliminates habitat for some nesting songbirds as well as increases competition between deer and other wildlife due to reduced food sources. Deer have strong, species-specific feeding preferences. The most highly preferred species are the first to decline or disappear when deer numbers are high. Furthermore, deer have been shown to be prolific seed dispersers for many of the most invasive non-native species. The result is greatly impoverished native species diversity, failure of native tree regeneration, and the rapid proliferation of invasive species. It is likely their selective feeding habits and effective seed dispersal make the spread of invasive plants much faster than would be the case without deer, even where herds are only moderately oversized.

#### Conservation Actions:

- Maintaining the current hydrologic regime is critical to the persistence of the community and rare species at this site. Drilling, mining, or other disruptions to the bedrock should not be undertaken within half a mile of a seepage wetland without a thorough understanding of bedrock layers and groundwater flows. Groundwater flow patterns do not always mirror surface watersheds, and in some cases aquifers may be contiguous over large areas.
- Cave entrances should be buffered from disturbance by at least 160 meters (525 feet). Blasting and other activities that will affect the bedrock should be avoided within this area so as not to damage the cave. During the months of November through April, foot traffic or other disturbances in the cave or near its mouth should be avoided.
- Allow the forested habitats to achieve and maintain old growth conditions. Avoid fragmenting the existing forested areas with additional buildings or infrastructure. Avoid logging in this area except as it relates to invasive species removal.
- Control invasive species to prevent native species from being crowded out of the habitat. Invasive species are well established along roadways, field edges and utility corridors and have begun to colonize parts of the forest interior. Removal of invasive shrubs (multiflora rose, Japanese barberry, bush honeysuckle and autumn olive) can be most effective as they can shade out the ground, preventing growth of tree seedlings and a diverse herbaceous layer. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try and repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will be necessary.
- Reduce the deer density in the area. Uncommon species of native plants are particularly susceptible to deer herbivory.

#### References:

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